## Abstract of the Disclosure

A multiplexer and method for chip-synchronous code-division multiple access (CDMA) signals that produces a *constant envelope* signal rather than the fluctuating amplitude signal that results from linear superposition of individual CDMA waveforms. Even though the multiplexer is non-linear and incurs a multiplexing loss, its output signal permits use of a saturating (Class C) high power amplifier (HPA), as opposed to a linear, Class A amplifier run at several dB backoff, resulting in a net increase in effective transmitter power usage. The recouped transmit power can be used to improve quality of service (QoS), increase coverage, or increase traffic capacity without requiring any modification to the user equipment. Next generation user sets, however, are in position to reap further benefits from the new multiplexed signal format. Using knowledge of multiple spread spectrum codes in the multiplex, they can employ signal processing that further improves their performance and/or decreases their received power requirements. This multiplexer applies to a variety of CDMA spread spectrum modulation formats, including BPSK (Binary Phase-Shift Keying), QPSK (Quadrature Phase-Shift Keying) and modulations that utilize arbitrary RF carrier phases. As such it can be used in many applications. Examples given herein refer to the IS-95 forward link interface, but the multiplexing technique has a wide range of CDMA and CDMA/FDMA (frequency-division multiple access) applications, including general cellular base station forward traffic channels, cellular subscriber station multiple-channel reverse traffic channels (e.g. IS-95 subscriber Internet access) and satellite downlinks.

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